

**What is claimed is:**

Claim 1. An arc tube comprising:

an arc tube body; and

a foil joined with the arc tube body by pinch seal, the arc tube  
5 body having a compressive stress of  $10^5$  N/m<sup>2</sup> or more along a  
junction surface with the foil at an ordinary temperature, said arc  
tube body containing quartz glass.

10 Claim 2. The arc tube according to claim 1, wherein a ratio  
A/B of a width A and a thickness B in a pinch seal portion of the arc  
tube is  $1.8 \leq A/B \leq 2.8$ .

15 Claim 3. The arc tube according to claim 1, wherein the foil  
is elongated no more than 15% of the foil's pre-pinch seal  
dimensions.

20 Claim 4. The arc tube according to claim 2, wherein the foil  
is elongated no more than 15% of the foil's pre-pinch seal  
dimensions.

25 Claim 5. The arc tube according claim1, further including a  
plurality of cracks formed on the junction surface of the foil and the  
arc tube body, wherein a maximum depth of the cracks is 50% or less  
of a thickness of the molybdenum foil.

Claim 6. The arc tube according claim 2, further including a plurality of cracks formed on the junction surface of the foil and the arc tube body, wherein a maximum depth of the cracks is 50% or less of a thickness of the molybdenum foil.

Claim 7. The arc tube according claim 3, further including a plurality of cracks formed on the junction surface of the foil and the arc tube body, wherein a maximum depth of the cracks is 50% or less of a thickness of the molybdenum foil.

Claim 8. The arc tube according to claim 1, wherein the foil contains molybdenum.

Claim 9. A method for manufacturing an arc tube comprising: pinch-sealing a foil with an arc tube body such that the arc tube body has a compressive stress of  $10^5 \text{ N/m}^2$  or more along a junction surface with the foil at an ordinary temperature.

Claim 10. A method for manufacturing an arc tube according to claim 9, further including controlling the pinch-sealing such that a ratio A/B of a width A and a thickness B of at least one pinch seal portion of the arc tube is set to  $1.8 \leq A/B \leq 2.8$ .

Claim 11. A method for manufacturing an arc tube according

to claim 9, further including controlling the pinch-sealing so that the foil is elongated to no more than 15% of the foil's pre-pinch seal dimensions.

5           Claim 12. A method for manufacturing an arc tube according to claim 9, further including forming a plurality of cracks on the junction surface of the foil and the arc tube body during pinch-sealing, and controlling a maximum depth of the cracks during formation to 50% or less of a thickness of the molybdenum foil.

10           Claim 13. A method for manufacturing an arc tube according to claim 9, further including thermally interlocking the arc tube body and the foil by heating the arc tube body and the foil until a portion of the arc tube body flows into concave-convex surfaces the  
15           foil.

          Claim 14. A method for manufacturing an arc tube according to claim 13, further including controlling heating of the arc tube body and the foil during thermal interlocking such that a size per  
20           grain of recrystallized grains grown by the foil during thermal interlocking does not exceed 50 $\mu$ m.

bulb